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MALACOLOGICAL NOTES FROM THE AMAZON RIVER, BRAZIL

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The mollusks listed below were obtained during a recent trip to the Amazon country (July to September, 1924) as a member of the Third Hamilton Rice Expedition, in conjunction with the Department of Tropical Medicine of Harvard Medical School. The specimens were all identified by Dr. H. A. Pilsbry, whom I wish to thank most heartily for his help.

Only the lowland country was visited. Among the localities mentioned, Belem, Pará and Manáos are well known. The others are mostly in the State of Amazonas: San Francisco is on the left bank of the lower Rio Negro, in about 2° S. and 61° W.; Carvoeiro and San Alberto are on the same river, but near the confluence of the Rio Branco, in approximately 1° 30' S. and 62° W., the former on the right bank and the latter on the left bank; Santa Maria is on the left bank of the lower Rio Branco, in about 0° 45' S. and 62° W.

Streptaxis glaber Pfeiffer. Santa Maria, many dead specimens of normal size. Carvoeiro, one live specimen of a much smaller form. Manáos, very many living specimens of the small form, only about half the size of those of Santa Maria.

Gulella bicolor (Hutton). A few dead specimens were found

at Manáos. This species, originally described from the Seychelles, was evidently introduced by man into Brazil.

Bulimulus tenuissimus (d'Orbigny). This was found in abundance at Belem, Pará, on low herbs and grass in the central square of the town; young, living specimens were also taken at Carvoeiro. Fred Baker has listed it previously from Pará and Itacoatiara in the Amazon Basin.

Subulina octona (Bruguière). Manáos, many living specimens. Carvoeiro, abundant. Santa Maria, many dead specimens. This species, though apparently indigenous to tropical America and Africa, has been widely spread by man.

Opeas gracile (Hutton). Manáos, many specimens, some of them alive. Carvoeiro, many, but all dead. Though this species has been scattered by man throughout the tropics, it has as yet been recorded from two African localities only.

Opeas beckianum (Pfeiffer). Manáos, a few specimens, some of them alive.

Opeas pumilum (Pfeiffer). Carvoeiro, a number of dead specimens.

Leptinaria lamellata (Potiez and Michaud). Manáos, one dead specimen. Carvoeiro, abundant and alive. San Alberto, living specimens under rotting leaves of bananas in an abandoned plantation.

Leptinaria lamellata concentrica (Reeve). Santa Maria, one dead specimen.

Leptinaria n. sp. Carvoeiro, several living specimens.

Succinea manaosensis Pilsbry. This was found in abundance in a garden at Manáos, but no living examples were seen.

Ampullarius olivaceus (Spix), variety. One large, adult specimen was found dead at San Francisco in a low, swampy patch of forest near the shore of the Rio Negro.

Ampullarius sp. (near *metcalfei* Reeve). Numerous immature specimens from Manáos, where they are abundant in flooded excavations of the unfinished harbor works. No full-grown examples were seen.

Hyrja corrugata Lamarck. Several examples were bought in the market at Belem, Pará, and were said to have been taken from one of the branches of the Pará River.

Prisodon syrmatophorus (Meuschen). This was bought in the market at Belem, Pará, with the foregoing and probably came from one of the rivers in the vicinity

Anodontites trapesialis (Lamarck), var. Two examples were given to me by Mr. P. Le Cointe, who obtained them on the shores of the Terra Santa Lake, near the right bank of the Amazon River, east of Faro, in about 2° 10' S. 56° 45' W.

The malacologist who visits the tropics for the first time expects to be overloaded with material, but if he must restrict his researches to the lowlands he is usually quite disappointed. In the moist forests there are but few large and showy forms, the remainder being never numerous in individuals and quite well hidden. In the open savanna country the rank and dense grass renders researches still more tedious in the wet season, while during the drought most species are aestivating deep in the ground or in crevices of rocks or trees. Ecological conditions are evidently quite uniform in the tropical lowlands over large areas; furthermore, certain factors, such as the extensive flooding of the forest near the banks of the rivers and the scarcity of lime in the soil, are decidedly adverse to terrestrial snail life. I have found in Africa that the mountains are malacologically much richer, especially where they are covered with dense forests; not only are the rocks more varied, but altitude produces a series of life zones, while the exposure of the slopes further modifies environmental conditions. Thus in the Belgian Congo a quite narrow mountainous strip along the eastern border has yielded more species of land mollusks than the remainder of the territory. I suspect that the same rule might hold true for South America, although I have had no occasion to visit the mountains of that continent.

Only on two occasions during my trip to Brazil did I find mollusks in fair abundance of species and individuals. The seven land shells listed above from Manáos, including the *Succinea*, were obtained from a small garden adjoining Dr. H. W. Thomas' Medical Laboratory, where they were aestivating between stony débris and in the crevices of the walls. Many specimens of *Veronicella* were found with them. The spot was very dry, as we had but a few, short rain showers during the

three weeks of our stay at Manáos (end of July and beginning of August). In the same garden I found a number of living, small, bulimulid snails, which can not be identified as the specimens have been mislaid; they were solidly fixed with the aperture to the under side of the leaves or more rarely to the thin twigs of a guava tree and covered all over with a coating of dirt (perhaps excremental matter of the snail). On the journey up the Rio Negro rains were frequent so that conditions were more favorable for snail life. At Carvoeiro eight species of snails and a *Veronicella* were taken in large numbers crawling over rubbish in waste places within the town. They included not only a new species of *Leptinaria*, but also a minute pupillid not listed here, which was especially abundant on decaying bones. *Bulimulus tenuissimus* (d'Orbigny) may further be mentioned as the host of a parasitic fly of the family Sarcophagidae (*Malacophagula neotropica* J. Bequaert), the maggot of which appears to attack the live and healthy snail, as the European *Melinda cognata* (Meigen) is known to do with certain Helicidae.

Fresh-water mollusks were surprisingly scarce. Only immature specimens of *Ampullarius* were seen at Pará and Manáos. No Planorbidae nor Physidae were found, although special search was made for these snails which are of considerable sanitary importance as intermediary hosts of parasitic worms. In this connection I may call attention to a paper by Dr. A. da Matta, a copy of which I owe to the generosity of the author.¹ No species of *Planorbis* was found by him at Manáos. So far as I can discover, the only planorbid known with certainty from the forested lowlands of the Amazon is *P. anatinus* d'Orbigny which was taken by F. Baker (with *Physa rivalis*) in an artificial lake in the park in front of the Cathedral of Pará. Planorbidae, however, are common in many parts of the drier, savanna country, in Venezuela, as well as in southern and eastern Brazil. I have made analogous observations in Africa, where the Planorbidae and Lymnaeidae are quite abundant in the savanna

¹ A. da Matta. Malacologia medica. Notas sobre a geographia sul-americana do molusco Planorbis e provavel disseminação da Schistosomose hepato-intestinal. Amazonas Medico (2), II, No. 8, 1919, pp. 179-184.

country, but generally avoid the forest belt of the lowlands. In the rain forest they are, with very few exceptions, only met with in ponds and ditches near human settlements.

The two unionids (*Hyria* and *Prisodon*) were obtained in the market at Pará, where they were offered for sale as a local remedy against eye sore; the pearly inside of the mussel being scraped off and mixed with water.

NEW SPECIES OF FRESH-WATER OPERCULATES

BY BRYANT WALKER

I

LANISTES PILSBRYI n. sp. Pl. 1, fig. 1.

Shell large, thin, globose-conic, umbilicate; whorls about six, the last greatly inflated, flattened and obtusely shouldered above, rounded below and without any angulation around the umbilicus; spire conic, obtuse and with a sharp carina on the shoulder of the two apical whorls; yellow with many spiral bands of greenish-brown, wider and more numerous on the upper part of the whorl, apical whorls dark brown; surface smooth with fine, regular lines of growth and covered with a minute, close, somewhat irregular spiral sculpture, scarcely visible to the naked eye, which as it cuts the lines of growth gives a granular appearance to the surface when examined under a glass; aperture large, a little oblique, suboval, wider below, interior white showing the color bands; lip sharp, quite regularly rounded on the outer margin, drawn back and only slightly curved on the inner. Operculum unknown.

Type (apex eroded) alt. 62, major diam. 64.4, minor diam. 50.3; aperture alt. 49, diam. 35.1 mm. An immature shell with five whorls and a perfect apex measures, alt. 43.2, major diam. 38.4, minor diam. 35.3 mm.

Type locality, So River, Ebolowa, Cameroon.

Types No. 73451, Coll. Walker. Paratype in the collection of the Philadelphia Academy.

